Robyn Pretzloff. A New Method of Training Computing Lab Assistants. A Master's Project for the M.S. in I.S. degree. June, 2000. 36 pages. Advisor: Gregory B. Newby.

This project developed a graduate level independent study course to be used in the training of graduate assistants working in the computer lab at the School of Library and Information Science at the University of North Carolina at Chapel Hill. The first section of this paper describes the reasons for proposing a change in training method. The course syllabus and other course related content make up the second section of the paper. The goal of the course is to train lab assistants more efficiently while they earn graduate level credit. The course content can be adapted to changes in technology, staffing, and other requirements and needs.

Heading:

Information Professionals – Training.

A NEW METHOD OF TRAINING COMPUTING LAB ASSISTANTS

by
Robyn Pretzloff

A Master's paper submitted to the faculty of the
School of Information and Library Science of the
University of North Carolina at Chapel Hill in partial
fulfillment of the requirements for the degree of
Master of Science in Information Science.

Chapel Hill, North Carolina

June, 2000

Approved by:

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Advisor

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Introduction

This paper describes the initial conception, evolution, and completion of a new Independent Study class, INLS 300. The course will be limited to graduate students working as Computer Lab assistants in the School of Library and Information Science at the University of North Carolina at Chapel Hill. This Independent Study class was created as a master's project in response to the lack of formal training available to Computer Lab assistants and a desire to marry practical hands-on training with college credit.

Problem Description

The information technology staff at the School of Library and Information Science at the University of North Carolina at Chapel Hill, or SILS, consists of two full time staff members and a small group of graduate assistants who work on a part time basis. Usually there are four to five lab assistants working during summer sessions and usually seven or eight lab assistants working during the academic year. These graduate assistants are called "lab assistants" because they staff the Help Desk in the school's computer lab. However this is a misnomer. A lab assistant's work is not limited to the confines of the computer lab. Like the full time staff, a lab assistant may be called upon to work with any of the machines or equipment SILS uses. Lab assistants are full time students who take a minimum of 9 graduate hours in addition to working 15 hours each week.

SILS has been experiencing an increase in the number of users, students and faculty, in the past several months. New machines have also been added to the network, both PCs for staff and faculty use as well as servers used by faculty and students for

research and other education purposes. The school is also exploring options for expanding their undergraduate minor program into an undergraduate major in the next few years. This will greatly increase the number of users and machines the school IT staff will have to support. SILS was recently ranked one of the two number one Library Science programs by *U.S. News & World Report*. It is not unreasonable to assume that the number of graduate students entering the program will also increase. Despite these events, the number of full time IT staff has remained constant even with the current increase in users and additional equipment to maintain. The number of lab assistants has also remained the same.

In addition to this problem of increased pressure on the current staff due to an increase in users and additional equipment, there is the much older problem of how lab assistants are hired and trained. It is important to note that SILS treats lab assistantships as graduate assistantships. An award of a graduate assistantship may be a form of financial aid. This means that although SILS does choose from a pool of incoming students for the assistantship, they may choose a student who is in "need" as opposed to simply being qualified for the job. SILS also does not pay competitively enough to attract technically skilled students to work in the school's computer lab. Most students who are technically skilled can find a much higher paying job with companies in Research Triangle Park. In short, this means that most lab assistants are technically unskilled for the position and are unable to perform the majority of their duties.

Lastly, there is a problem with the current method of training lab assistants. Training consists of teaching the lab assistants procedures for opening and closing the lab as well as other simple duties, such as changing toner in the printers. The full time staff

do not have time to do much more than that. In the past, “training” for a lab assistant was largely learning on the job, alone. Furthermore, only one lab assistant staffs the Help Desk at a time, so there is not much interaction between one’s fellow employees.

Proposed Solution

A logical step to help remedy this problem is to improve the way lab assistants are trained. Since lab assistants are full time students, it is possible to incorporate their training for the lab into their current class schedule. This paper proposes that each lab assistant be given the opportunity to enroll in an Independent Study course where they will be able to both receive graduate level credit and also learn skills that can be used during their work in the lab. The students will gain valuable technical experience and SILS will be able to take an existing labor resource and transform it into a more productive work force.

Scott Adams, SILS’ current Director of Instructional Technology, will teach the first implementation of the course. It is recommended that SILS assigns a full time graduate student as the teaching and research assistant for each semester the course is taught. This graduate assistantship would be similar to the positions awarded to students who assist full time faculty members at SILS. The graduate assistant would be responsible for updating the resource materials for the class, maintaining the class home page and syllabus, and handling various administrative tasks.

The content of the course will deal with hands on database, web and systems administration tasks in SILS. This includes not only the machines and equipment in the SILS Computer Lab, but any equipment and machines used by SILS students, faculty, and staff. It is possible that this class may evolve beyond the confines of the lab and lab

staff and may be incorporated into the SILS curriculum. The course content can be adapted to changes in technology, staffing, and SILS' requirements and needs.

The current content of the course was adapted to meet the needs of Scott Adams. The course was created in both an electronic and paper format. Dr. Greg Newby, the faculty advisor for this project, granted permission to use the same general design that he uses on his own class web pages for this course's online syllabi and other course related web pages.

What follows is the paper version of the course syllabus and the course modules sections. An electronic version can be found online at http://ils.unc.edu/~pretr/masters_project/

Appendix A

Course Syllabus

The syllabus is the core element of the course. It includes the course description, the course objectives, required texts, and course assignments and grading.

Course Syllabus

Class Description: INLS 300: The Independent Study in Database, Web, and Systems Administration is a three credit hour graduate level class. A three credit hour class meets in the classroom for 3 hours each week of the semester. Since this is an Independent Study class with the bulk of the work being done outside of the classroom setting, the class will meet only as a group once a week for 90 minutes. The weekly class meetings will be roundtable discussions. The other 90 minutes normally spent on lecture in other classes each week will be spent working hands-on in the lab. Students are not expected to be able to complete their course work in only 90 minutes a week. Students will be engaged in more than 90 minutes of working on projects each week of the semester.

Course Objectives:

1. To develop a broad knowledge base of system administration on Microsoft or Unix platforms.
2. To use these skills and knowledge to complete projects on the machines in SILS.
3. To learn to work autonomously.
4. To develop problem solving skills.
5. To learn skills that can be used to get a job after graduation.

Pre-requisites: Enrollment is limited to SILS students working as graduate assistants in the SILS Computer Lab.

Facilities: Depending on the modules chosen a student may be exposed to all of the machines used by SILS.

Required Texts: All students are required to purchase and read one of the following books depending on which Learning Tree is chosen. There are required texts for the UNIX and Microsoft sections of the course as well.

Students choosing the UNIX Learning Tree are required to purchase:

Essential System Administration : Help for Unix System Administrators (Nutshell Handbook)
Aeleen Frisch
O'Reilly & Associates; ISBN: 1565921275

Students choosing the Microsoft Learning Tree are required to purchase:

Essential Windows Nt System Administration
Aeleen Frisch
O'Reilly & Associates; ISBN: 1565922743

Both books are published by O'Reilly. They are available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Additionally, a listing of required and recommended texts and other resources is listed under each module heading in the Modules section. A list of the entire readings and resources can be found in the Resources section.

Class Format: Aside from being an Independent Study course, this class is structured differently than most classes here at SILS. The course content is divided between the UNIX and Microsoft platforms. Due to the widely varied and vast content of these two computer platforms, the course is arranged into smaller sections called modules. There are five modules under the UNIX platform and five modules under the Microsoft platform. The modules are designed to give students the opportunity to concentrate on a specific area of the platform. Each student must select one of the two platforms to study. Within that platform, each student must complete two modules.

The majority of the work and learning in this class will be 'hands-on.' There will be assigned readings and Weekly Status Reports that summarize the progress made on student projects. Weekly Status Reports are brief, only a few sentences in length. Students will also be required to keep a Journal for each module, which details the progress of the student projects.
A short paper for each module, 3-4 pages in length, is required at the end of the semester. The Journals and the Final Papers will be due at the end of the semester.

Evaluation: All required work must be completed in order to receive a passing grade in INLS 300. Evaluation is based on class attendance and participation, handing in Weekly Status Reports, the Project Journals, and the Project Mini-Papers.

Class Attendance and Participation: Class attendance is mandatory. Any student missing more than three class meetings will receive a failing grade in the course.

All Written Assignments: All spelling and grammar errors will be penalized. The Weekly Status Reports and the Project Journal can be informal but they should still be professional. The Final Papers should be both formal and professional.

Weekly Status Reports: Since the class meets only once a week, it is important to use this time as efficiently. Each student is required to hand in a Weekly Status Report that summarizes the progress made on each project and any questions, problems, solutions, and discoveries the student encountered during the prior week.

These reports must be handed in before 4pm the day BEFORE class meets. Insuring the instructor will be able to read the reports before class. Students are also encouraged to post to the class mailing list their reports, questions, problems, solutions, and success stories.

The Weekly Status Reports should be no more than a page in length. A few sentences per project is fine. These Reports should be "highlights" from your Module Journals and must include the following information:

- Module
- Name of Project

- Date or Date and Time
- What you did
- Problems, if any
- Questions, if any

Module Journals: Students will keep a Module Journal for each of the two modules selected. Each entry in the Module Journal must have the following:

- Module
- Name of Project
- Date or Date and Time
- What you did
- Problems, if any
- Questions, if any
- Solutions, if any
- Discoveries, if any
- Where and why you stopped
- Additional notes, if any

Students must always have the Module Journal with them EVERY time they do anything related to their Module, such as installations, writing a script, upgrading drivers. The Module Journal records each student's work and serves as a knowledge base. It can be used to track changes in their thinking and learning processes.

Students must bring their Module Journals to class every week. The instructor will use the Weekly Status Reports to ask you questions about your Module Journals. The instructor will periodically check Module Journals to make sure they are updated and complete.

The Module Journals account for 50% of your grade and are designed to become a valuable resource that you can use after the class has ended.

Final Papers: For each module completed, students are required to a write a short paper summarizing what they have learned and accomplished. The papers must be 3-4 pages doubled spaced and are due at the end of the semester. These short papers should resemble a systems analyst's or a consultant's report. The paper should have an Introduction, Background, Project Summary and Conclusion. The Introduction and Background sections should include history and background knowledge of the project. For example, if the project dealt with an installation and maintenance of an Apache Web Server, that section should include information about the creators of Apache and the history of the application.

In addition, the papers should include a section that lists all of the resources the student used to complete the module. This section, called the Knowledge Base, will be posted the web.

Grading Breakdown: Class attendance and participation will account for 10% of the final course grade. Weekly Status Reports will account for 10% of the final course grade. Module Journals will account for 50% of the final course grade. The Final Papers will account for 30% of the final course grade.

Course Grading: Graduate grading for the course will be as follows:

- H 95-100 points
- P+ 90-94 points
- P 89-84 points
- P- 80-84 points
- L 70-79 points
- F 69 points and below

Appendix B
Modules

The following page describes what a “module” is and how it relates to this course.

Modules

What are Modules? This course explores two computer platforms: UNIX and Microsoft. Due to the widely varied and vast content of these two platforms, the course is arranged into smaller sections called modules. There are five modules under the UNIX platform and five modules under the Microsoft platform.

Perhaps it is easiest to think of this course is to envision two trees in a field. These trees are Learning Trees. One is a UNIX Learning Tree, the other a Microsoft Learning Tree. Each Learning Tree branches or Learning Modules. Each Learning Module, or branch of the Learning Tree, has room for variation and for each student to choose one aspect of the entire Learning Module. Each aspect of a Learning Module can be compared to the many leaves on a tree branch.

Keeping with the tree analogy, students will commit to one Learning Tree for the duration of the course. Students cannot select Learning Modules from both trees. The UNIX and Microsoft Learning Trees have different required textbooks. Students are expected to become familiar with the platform as a whole and focus on two more specific areas via the modules.

Each student will select two modules to explore during the course. Students will be allowed to work in teams of no more than two. However, when two students team up their modules, they will be required to complete one additional module on their own. A student doing both modules without a team, will complete only two. The students who team up on modules will need to complete two modules as a team and one module alone, a total of three modules.

In each of these modules there is obvious overlap with other modules. Each module varies in the amount of contact a student will have with people and/or machines. Under each module exists some application(s) that is(are) associated with the module. Students are expected to become highly skilled in those applications.

Please click on a link below to explore either a Learning Tree or a specific Module under that particular platform.

UNIX	**Microsoft**
System Scripting	PC Software Installation and Updates
Web Server Administration	Database Administration
Backups	PC Hardware
Installation and Upgrade	Installation and Upgrade
System Security Management	System Security Management

Appendix C
The UNIX Modules

This section describes each of the five individual UNIX modules in detail.

The UNIX Learning Tree

Learning Tree Description: Students selecting the UNIX Learning Tree will be expected to become familiar with and comfortable using UNIX systems. Students are also expected to attain a general knowledge about all areas of a UNIX system, even those not involving their chosen UNIX Modules. Within the Modules, students will focus and master a particular aspect of a UNIX system that the Module represents.

Learning Tree Objectives:

1. Become familiar with and know all areas of a UNIX system
2. Become proficient in a UNIX editor such as vi or Emacs

Required Text:

Essential System Administration: Help for Unix System Administrators (Nutshell Handbook)
Aeleen Frisch
O'Reilly & Associates; ISBN: 1565921275

It is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Students will be expected to read the required text in its *entirety* for this Learning Tree.

UNIX Modules: Whereas choosing the UNIX Learning Tree requires students to gain general knowledge of a UNIX system, it is within the Modules that students are expected to focus and master the particular aspect or aspects of a UNIX system that the Module represents.

The UNIX Modules are as follows. Please click on a link below to find out more about each Module.

System Scripting	Web Server Administration	Backups	Installation and Upgrade	System Security Management

UNIX System Scripting Module

Module Description: Systems administrators often write shell scripts to automate tasks on their system. Although there are several shell scripting languages, this module will focus on Perl. Students choosing this module will be expected to both write Perl scripts and modify existing Perl scripts. Students will be required to comment extensively as they program in order to provide thorough documentation for others. Students may work on Linux boxes or Solaris boxes, or both. Because system scripting requires working with the entire system, students choosing this module are expected to become extremely knowledgeable of the parameters and workings of a UNIX system.

Module Objectives:

1. To become proficient in Perl and the Perl modules
2. To become proficient in a UNIX editor such as vi or Emacs
3. To write shell scripts to automate tasks on the server
4. To modify existing shell scripts on the server
5. To become comfortable working with both Linux and Solaris UNIX flavors
6. To update system Perl modules as necessary

Required Text:

Programming Perl
Tom Christiansen, Stephen Potter, Randal L. Schwartz, Larry Wall
O'Reilly & Associates; ISBN: 156592149

This book is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Recommended Texts:

Perl Cookbook
Tom Christiansen, Nathan Torkington, Larry Wall
O'Reilly & Associates; ISBN: 1565922433

Effective Perl Programming
Joseph N. Hall
Addison-Wesley Pub Co; ISBN: 0201419750

These books are available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Online Resources: There are many online resources for Perl and Perl Modules. Students are encouraged to continually seek out additional Perl related resources as needed. Students will be required to compile a list of all discoveries of additional resources, in both electronic and print format, relating to their module in the Final Paper. Some Perl related online resources are listed below to help students get started:

Perl Crawler Search Engine ... PerlScripters ... Perl Module Anatomy ...

Perl Section at progsource.com … Perl Mongers ... Comprehensive Perl Archive

Network ... O'Reilly's www.perl.com ... PerlRing ... The Perl Journal …

The University of Florida Perl Archive ... Free Code from www.freecode.com ...

MIT's Perl Page … Online Syllabus for a 10 Day UNIX Perl Programming Class ...

SHELLdorado ... The *Unix Review* Perl Columns …

UNIX & Programming Documentation from the Software Engineering Laboratory - N.T.U.A. ... The UNIX Reference Desk

UNIX Web Server Administration Module

Module Description: Students choosing this module will be required to master the Apache Web Server. Students will be responsible for the installation, maintenance, troubleshooting, and user support of an Apache Web Server. Students will also be expected to become proficient in both Linux and Solaris UNIX flavors. Since SILS maintains an Apache web server on Ruby, students choosing this module will be expected to support the SILS students, faculty and staff who use the web server on Ruby after the module has been completed.

Module Objectives:

1. To install and maintain an Apache server which includes updating, upgrading and patching the server as needed
2. To become proficient in PHP
3. To troubleshoot web server problems
4. To monitor web server logs
5. To learn to use the Apache Modules
6. To support web server users
7. To understand the directives in the Apache conf file
8. To learn to understand all aspects of the Apache web server
9. To become proficient in a UNIX editor such as vi or Emacs

Prerequisite skills: Students choosing this module should have some web design experience. Familiarity with HTML and general knowledge of how the Internet works is required.

Required Text:

Apache: The Definitive Guide
Ben Laurie, Peter Laurie, Robert Denn (Editor)
O'Reilly & Associates; ISBN: 1565925289

This book is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Online Resources: There are many online resources for Apache and PHP. Students are encouraged to consult additional Apache and PHP related resources as needed. Students will be required to compile a list of all discoveries of additional resources, in both electronic and print format, relating to their module in the Final Paper. Some Apache and PHP related online resources are listed below:

The Apache Software Foundation ... PHPBuilder.com ... PHP: Hypertext Preprocessor ...

phpWizard.net … PHP Example Scripts ... PHP Help from IONLINE ...

FAQT PHP Knowledge Base ... phphelp.com

UNIX Backups Module

Module Description: Backing up your data is extremely important. Students choosing this module will be required to become highly proficient in Legato Networker. Students will need to become familiar with both UNIX and Microsoft platforms since they will be performing backups on both UNIX and NT boxes. In addition to learning technical skills, students will also be expected to learn data management. For example, a student choosing this module should learn to renegotiate the way the machines are backed up once a new client is added.

Module Objectives:

1. To become highly proficient in Legato Networker
2. To learn to use both the GUI and the command line versions of Legato
3. To learn and understand the entire back up process
4. To learn to complete backups for special applications such as "hot backups" for open databases
5. To learn and understand how to use Legato's special modules for applications such as Oracle and Exchange
6. To learn ufsdump, usfrestore
7. To learn data management in an expanding IT environment

Required Texts:

Unix Backup & Recovery
W. Curtis Preston, Gigi Estabrook (Editor)
O'Reilly & Associates; ISBN: 1565926420

This book is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Students choosing this module will be required to read the Legato Networker Administrator's Guide that SILS owns. In addition, students will also be required to read the online Technical Documentation for UNIX and NT that is available at Legato's Support and Services page and subscribe to the vendor mailing list.

Recommended Text:

Windows Nt Backup & Restore
Jody Leber, Robert Denn (Editor)
O'Reilly & Associates; ISBN: 1565922727

This book is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Online Resources: Because the UNIX Backups Module is vendor specific, most of the online sources are on the vendor website. Students are required to become familiar with

the technical documentation archives on the Legato website. However, other online resources related to backups that are not vendor specific will also be helpful. Students are encouraged to seek out additional backup related resources as needed. Students will be required to compile a list of all discoveries of additional resources, in both electronic and print format, relating to their module in the Final Paper. Some backup related online resources are listed below:

Legato Systems ... The Evolution of Backup ... Data Loss Dangers …

Moving Forward Means Backing Up Carefully … Disaster Recovery Journal's Homepage

UNIX Installation and Upgrade Module

Module Description: Students choosing this module will be responsible for software upgrades and installations on their servers. Students will be expected to keep abreast of software and system upgrades and security patches. Students should subscribe to a vendor mailing list for this purpose. Students are also expected to pay attention to the way in which the upgrade process involves the system's users. Students are required to announce the upgrade to their users before completing it. They must also collect user feedback early after the upgrade has been done. The students will also be required to make the new version of the software the system default and finally remove the old version. Students will be required to learn how to install both source code and RPM versions of UNIX packages. Students may work on either Linux boxes or Solaris boxes or even both flavors of UNIX boxes. Because this module requires one to work with the system as a whole, students choosing this module are expected to become extremely knowledgeable about how the parameters and workings of a UNIX system.

Backups: It is *essential* that students choosing this module always backup data and programs before proceeding with a new installation or upgrade. Students may face a situation where the only choice is to abandon the new install or upgrade and restore the old version. Students are also required to script the entire installation or upgrade process.

Module Objectives:

1. To become proficient in installing and upgrading system software
2. To monitor vendor mailing lists and vendor web sites for new patches and upgrades
3. For Linux: to learn make, shell, rpm, tar, gzip
4. For Solaris: to learn make, shell, tar, zip, pkgadd/rm, patchadd/rm, patch
5. To become proficient in compiling and installing packages from source code and pre-packaged sources such as RPM or pkgadd
6. To become proficient in backing up and restoring old versions
7. To learn to document the entire installation and upgrade process. This includes but is *not* limited to scripting your session.
8. To troubleshoot problems with new installations and upgrades
9. To perform quality and assurance testing of installations and upgrades
10. To monitor the system for any problems after an installation or upgrade has been completed
11. To become familiar with both vendor and other FTP sites where new software packages can be downloaded

12. To become familiar with different libraries needed for various packages

Required Texts: Students are not required to purchase any texts for this module. Students will be required to read the man pages of any commands or utilities that they will use during an installation or upgrade. Students will be required to read available vendor documentation as appropriate as well. SILS owns vendor documentation for both Solaris and Linux that the students may borrow and read. It is highly recommended that students take advantage of the UNIX materials and books that SILS has available.

Recommended Texts:

Running Linux
Matthias Kalle Dalheimer, Lar Kaufman, Matt Welsh, , Matthew Welsh
O'Reilly & Associates; ISBN: 156592469X

A Practical Guide to Solaris
Mark G. Sobell
Addison-Wesley Pub Co; ISBN: 020189548X

These books are available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Online Resources: There are many online resources for UNIX system installations and upgrades. Students are encouraged to consult additional UNIX system installation and upgrade related resources as needed. Students will be required to compile a list of all discoveries of additional resources, in both electronic and print format, relating to their module in the Final Paper. Some UNIX system installation and upgrade related online resources are listed below:

GNU Project Homepage ... The Linux Home Page ... Linux Journal ... LinuxWorld ...

MetaLab ... The Open Source Page … Pine Information Center ... REDHAT.com ...

SolarisGuide.com ... Sun Microsystems ... Sun Solaris ... Solaris2 FAQ …

The UNIX Reference Desk

UNIX System Security Management Module

Module Description:

Students choosing this module will be responsible for keeping their server patched and secure. This entails keeping abreast of system and vendor security issues, monitoring mailing lists such as BUGTRAQ for systems security flaws, patching the system, installing Tripwire or another intrusion detection device and monitoring the system for break ins.

Module Objectives:

1. To become proficient in patching the system
2. To install Tripwire or another system monitoring tool
3. To monitor system logs
4. To become familiar with pkgadd/rm, patchadd/rm, rpms, patch
5. To monitor system disk usage
6. To perform security audits
7. To monitor system for possible intrusions
8. To perform intrusion detection analysis in the event of an intrusion
9. To monitor mailing lists and web sites to stay informed on current information security issues and news

Required Text: Students are required to purchase:

UNIX System Security Tools
Seth T. Ross
McGraw-Hill; ISBN: 0079137881

This book is available from online booksellers such as Amazon.com as well as from most local bookstores in the area.

Recommended Texts:

Solaris Security
Peter H. Gregory
Prentice Hall; ISBN: 0130960535

Linux System Security: The Administrator's Guide to Open Source Security Tools
Scott Mann, Ellen L. Mitchell
Prentice Hall; ISBN: 0130158070

These books are available from online booksellers such as Amazon.com as well as from most local bookstores in the area.

Online Resources: There are many online resources for UNIX Security. Students are encouraged to consult additional UNIX Security related resources as needed. Students will be required to compile a list of all discoveries of additional resources, in both electronic and print format, relating to their module in the Final Paper. Some UNIX Security related online resources are listed below:

Technotronic.com ... Packet Storm ... UNIX Security Primer from MIT ... Insecure.org ...

2600: The Hacker Quarterly … Hacker News Network ... CIAC ... CERT ...

SANS Institute Online ... Security Focus ... Security at Attrition.org

Dr. Newby will be teaching INLS 187, Information Security during Fall 2000. Students are highly encouraged to peruse his INLS 187 class web pages for information and resources that may be helpful to them when completing this module.

Appendix D
The Microsoft Modules

This section describes each of the five individual Microsoft modules in detail.

The Microsoft Learning Tree

Learning Tree Description: Students selecting the Microsoft Learning Tree will be expected to become familiar with and comfortable using Microsoft systems. Students are also expected to attain a general knowledge about all areas of a Microsoft system, even those not involving their chosen Microsoft Modules. Within the Modules, students will focus and master a particular aspect of a Microsoft system that the Module represents.

Learning Tree Objectives:

1. Become familiar with and know all areas of a Microsoft system
2. Attain DOS proficiency

Required Text:

Essential Windows Nt System Administration
Aeleen Frisch
O'Reilly & Associates; ISBN: 1565922743

It is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Students will be expected to read the required text in its *entirety* for this Learning Tree.

Microsoft Modules: Whereas choosing the Microsoft Learning Tree requires students to gain general knowledge of a Microsoft system, it is within the Modules that students are expected to focus and master the particular aspect or aspects of a Microsoft system that the Module represents.

The Microsoft Modules are as follows. Please click on a link below to find out more about each Module.

PC Software Installation and Updates	Database Administration	PC Hardware	Installation and Upgrade	System Security Management

Microsoft PC Software Installation and Updates Module

Module Description: Students choosing this module will learn how to update and maintain all of the software on the SILS lab and faculty/staff PCs. Considering the vast amount of applications here at SILS, this is no easy task. In addition, students will learn help desk and support skills for the applications as well. Students choosing this module must learn how to diagnose and troubleshoot problems to determine whether the problem is a software one or a hardware one or both. Students will also be expected to keep the SILS machines as virus free as possible.

Module Objectives:

1. To become proficient in MS-DOS
2. To become proficient in the ghosting process
3. To become proficient w/PC Updater
4. To be able to assist with ghosting and other updates
5. To learn to create and map network drives
6. To learn the difference between multicast and the net command
7. To perform installations and upgrades of software packages on machines in the lab
8. When performing these installations or upgrades, students are expected to consider the how these packages will be used by lab patrons and factor this into any configuration decisions they may have to make
9. To learn to deal with vendors in the event of a software problem or bug
10. To learn to deal with issues involving software licenses
11. To monitor software viruses and update virus definitions on SILS machines

Required Texts: Students are not required to purchase any texts for this module. Students will be expected to read vendor software documentation as appropriate. In addition, students will also be required to read the online technical documentation for Ghost that is available on Symantec's Service and Support page.

Recommended Text:

Special Edition Using MS-DOS 6.22, Second Edition (SE Using)
Allen Wyatt (Editor), Bruce Hallberg, Ed Tiley, Jon Paisley
Que; ISBN: 078972040X

This book is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Online Resources: There are many online resources for PC software. Students are encouraged to consult additional PC software related resources as needed. Students will be required to compile a list of all discoveries of additional resources, in both electronic and print format, relating to their module in the Final Paper. Some PC software related online resources are listed below:

Symantec ... PC Updater ... Microsoft ... Windows 98 Annoyances ...

Windows 2000 Annoyances ... Microsoft Office …O'Reilly's Annoyances Resources ...

CERT Computer Virus Resources ... Virus Bulletin Home Page ... MS-DOS Forum …

MS-DOS Help from computerhope.com ... Download from CNET.com ... CWSApps ...

WinFiles.com

Microsoft Database Administration Module

Module Description: Students choosing this module will be required to become an Oracle DBA. Students will be responsible for the installation, maintenance, troubleshooting, and user support of one of more Oracle databases. Students will also be expected to become proficient in all aspects of an Oracle database, including Web databases. Since SILS maintains Oracle databases to be used both by faculty in a research capacity and also to students as an instructional aid, students choosing this module will be expected to support the SILS students, faculty and staff who use the databases after the module has been completed.

Module Objectives:

1. To become an Oracle DBA
2. To learn to program in Oracle PL/SQL
3. To install and maintain an Oracle database which includes updating, upgrading and patching
4. To troubleshoot database problems
5. To support database users, this includes user account management
6. To deal with database performance issues

Prerequisite skills: This module is only open to students who have already successfully completed INLS 256 Database Systems I. It is preferred that students have also successfully completed INLS 258 Database Systems II as well but it not required. Students must understand relational database theory and be at least familiar with SQL.

Required Text:

Oracle Database Administration : The Essential Reference
David Kreines, Brian Laskey, Deborah Russell (Editor)
O'Reilly & Associates; ISBN: 1565925165

This book is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Students choosing this module will be required to read the Oracle documentation that SILS owns. In addition, students will also be required to read the online Technical Documentation for Oracle as needed.

Online Resources: There are many online resources for Oracle. Students are encouraged to consult additional Oracle resources as needed. Students will be required to compile a list of all discoveries of additional resources, in both electronic and print format, relating to their module in the Final Paper. Some Oracle related resources are listed below:

Oracle ... DBASupport.com ... International Oracle Users Group - Americas ...

O'Reilly Oracle Center … Oracle Resources Center at TechnoSolutions

Microsoft PC Hardware Module

Module Description: Students choosing this module will learn and become responsible for the real brass tacks hands-on side of the SILS lab: fixing bad drive, dealing with vendors to replace parts, ordering supplies, dealing with surplus, managing growth of users and relating this to new hardware, as well as working within the SILS budget for new hardware. Students choosing this module must learn how to diagnose and troubleshoot problems to determine whether the problem is a software one or a hardware one or both. Students will also need to become knowledgeable about the various kinds of hardware. For example, a student should learn the difference between a SCSI and an IDE drive. After this module has been completed, students should be able to completely break down a PC, reassemble it and then get a C prompt.

Module Objectives:

1. To learn all about PC hardware
2. To develop and maintain a hardware/equipment database for the lab
3. To learn to deal with hardware vendors
4. To develop hardware diagnostic skills and use these skills to troubleshoot and solve hardware problems in the lab
5. To perform hardware installations as needed
6. To become proficient in MS-DOS

Required Text:

Upgrading and Repairing PCs (Upgrading and Repairing PC'S, 11th Edition)
Scott Mueller
Que Corp; ISBN: 0789719037

This book is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Recommended Text:

Special Edition Using MS-DOS 6.22, Second Edition (SE Using)
Allen Wyatt (Editor), Bruce Hallberg, Ed Tiley, Jon Paisley
Que; ISBN: 078972040X

This book is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Online Resources: There are many online resources for PC hardware. Students are encouraged to consult additional PC hardware resources as needed. Students will be required to compile a list of all discoveries of additional resources, in both electronic and print format, relating to their module in the Final Paper. Some PC hardware related resources are listed below:

PC Hardware FAQ ... MS-DOS Forum ... MS-DOS Help from computerhope.com ... Download from CNET.com … CWSApps ... WinFiles.com ... Dell Computer ... Tom's Hardware Guide

Microsoft NT/2000 Installation and Upgrade Module

Module Description: Students choosing this module will be responsible for software upgrades and installations on their servers. Students will be expected to keep abreast of software and system upgrades and security patches. Students should subscribe to a vendor mailing list for this purpose. Students are also expected to pay attention to the way in which the upgrade process involves the system's users. Students are required to announce the upgrade to their users before completing it. They must also collect user feedback early after the upgrade has been done. The students will also be required to make the new version of the software the system default and finally remove the old version. Because this module requires one to work with the system as a whole, students choosing this module are expected to become extremely knowledgeable about how the parameters and workings of an NT system.

Backups: It is essential that students choosing this module always backup data and programs before proceeding with a new
installation or upgrade. Students may face a situation where the only choice is to abandon the new install or upgrade and
restore the old version. Students are also required to script the entire installation or upgrade process.

Module Objectives:

1. Become proficient in installing and upgrading system software
2. Monitoring vendor mailing lists and vendor websites for news about when upgrades should be completed
3. Become proficient in backing up and restoring old versions when necessary
4. Learn to document the entire installation and upgrade process. This include but is not limited to scripting your session
5. Troubleshoot problems with new installations and upgrades
6. Perform some Q&A and other testing of your installations and upgrades
7. Monitoring the system after an installation or upgrade has been completed for any problems
8. Become familiar with both vendor and other FTP sites where new software packages can be downloaded
9. Become familiar with different libraries needed for various packages

Required Text:

Managing the Windows Nt Registry
Paul Robichaux
O'Reilly & Associates; ISBN: 1565923782

This book is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Recommended Texts:

Windows NT Event Logging (O'Reilly Nutshell)
James D. Murray, Debby Russell (Editor)
O'Reilly & Associates; ISBN: 1565925149

This book is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

There are several good NT books out there. SILS owns several NT related books that you can borrow. Before you buy a book, check to see what resources the SILS IT staff has available.

Online Resources: There are many online resources for NT. Students are encouraged to consult additional NT resources as needed. Students will be required to compile a list of all discoveries of additional resources, in both electronic and print format, relating to their module in the Final Paper. Some NT related resources are listed below:

Windows NT Home ... Windows NT FAQ ... World O'Windows ...

Windows 2000 Magazine ... WinFiles.com … Windows 2000 Annoyances ...

Windows NT Sysadmin Tools

Microsoft System Security Management Module

Module Description: Students choosing this module will be responsible for keeping their server as patched and as secure as possible. This entails keeping abreast of system and vendor security issues, monitoring mailing lists such as NT-BUGTRAQ for systems security flaws, patching the system, installing an intrusion detection device and monitoring the system for break ins.

Module Objectives:

1. To become proficient in patching the system
2. To install Tripwire or another system monitoring tool
3. To monitor system logs
4. To become familiar with pkgadd/rm, patchadd/rm, rpms, patch
5. To monitor system disk usage
6. To perform security audits
7. To monitor system for possible intrusions
8. To perform intrusion detection analysis in the event of an intrusion
9. To monitor mailing lists and websites to stay informed on current information security issues and news

Required Text:

Windows NT Security
by Michael McInerney
Prentice Hall; ISBN: 0130839906

This book is available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Recommended Texts:

Microsoft Windows Nt 4.0 Security, Audit, and Control (Microsoft Technical Reference)
by James G. Jumes (Editor), Coopers and Lybrand, Neil F. Cooper, Todd M. Feinman
Microsoft Press; ISBN: 157231818X ; Dimensions (in inches): 3.71 x 9.30 x 7.53

Web Security & Commerce (O'Reilly Nutshell)
by Simson Garfinkel, Gene Spafford
O'Reilly & Associates; ISBN: 1565922697

These books are available from online booksellers such as Amazon.com as well as from most bookstores in the area.

Online Resources: There are many online resources for NT Security. Students are encouraged to consult additional NT Security related resources as needed. Students will

be required to compile a list of all discoveries of additional resources, in both electronic and print format, relating to their module in the Final Paper. Some NT Security related online resources are
listed below:

NTSecurity.net ... computer-security/Windows NT Security FAQ ...

Hacker News Network ... L0pht Heavy Industries … NT-BUGTRAQ ...

Windows Security Information from tech-ref.com ... CIAC ... CERT ...

SANS Institute Online …Technotronic.com ... Packet Storm ...

UNIX Security Primer from MIT ... Insecure.org ... 2600: The Hacker Quarterly

Dr. Newby will be teaching INLS 187, Information Security during Fall 2000. Students are highly encouraged to peruse his INLS 187 class web pages for information and resources that may be helpful to them when completing this module.